

# **USGS Data Retrieval Plug-in**

May 2005

## **Introduction**

The USGS data retrieval plug-in is an optional capability that will retrieve daily historical and hourly real-time flows from the US Geological Survey web site and store that data into an HEC-DSS file. This plug-in is being provided in a beta form, usable in HEC-DSSVue Version 1.2 and other applications. It will be updated on the HEC web site as modifications become available.

An HEC-DSSVue plug-in is a set of Java software that is compiled and put into a Java “.jar” file. By simply placing this file into the HEC-DSSVue Plugins directory, it is automatically loaded and accessible from the HEC-DSSVue program. The purpose of a plug-in is similar to the jython scripting capability that is available in HEC-DSSVue. However, since plug-ins are written in the Java language, which is used by HEC-DSSVue, there are extended capabilities and controls available. The plug-in code can access the HEC-DSSVue API (Application Program Interface) directly. Typical uses for plug-ins are: complex mathematical operations; specialized formatting of data for entry into another application (such as a program that uses a “card format”); and, retrieval of data from a web site.

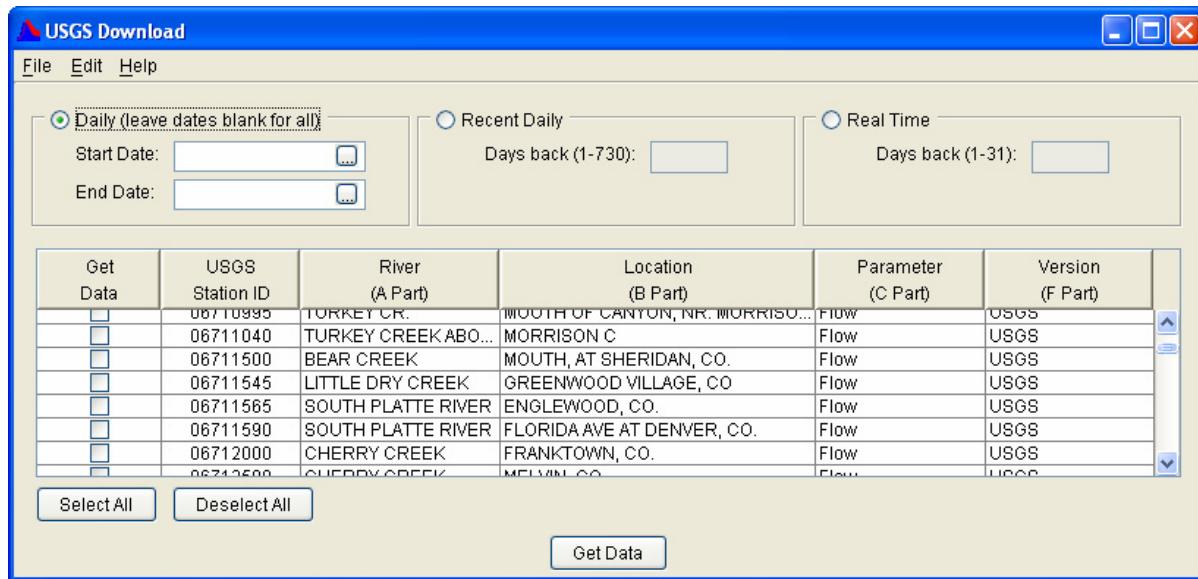
An example of the USGS data retrieval plug-in screen is given in Figure 1. Currently the plug-in will retrieve and store historical and recent daily flow data and real-time flow data, which are typically provided on a hourly or 15 minute time interval basis. You can retrieve daily historical data for the period of record by leaving the start and end date blank, or you can provide a time window for the period that you are interested in. Recent daily data, which is generally not verified, is available for a period of up to 730 days past. Real-time data is available for up to 31 days past. This data is typically provided in hourly or 15 minute intervals, and is also unverified. Currently, the USGS plug-in will only retrieve **Flow** data. Data availability can be obtained from the USGS water web site at: <http://waterdata.usgs.gov/nwis>.

## **Usage**

Plug-ins can be used by HEC-DSSVue Version 1.2 and later. To activate the USGS plug-in, the USGS.jar file is downloaded and placed in directory “Program Files\HEC\HEC-DSSVue\Plugins”, if it has not been installed already. To un-install a plug-in, simply remove it from the Plugins directory. When you run HEC-DSSVue, it detects plug-ins in the Plugins directory and automatically loads them.

To utilize the USGS plug-in you must be connected to the internet. Run HEC-DSSVue, open the HEC-DSS file that you want to store the retrieved data in and then select the USGS button on the main toolbar. This will open the USGS Download plug-in interface

with an empty station identifier table. From here, you can either open a previously saved table, manually enter the station information for the stations that you want, or automatically populate the table with a list of stations available on a state by state basis.



**Figure 1** USGS Plug-in Screen

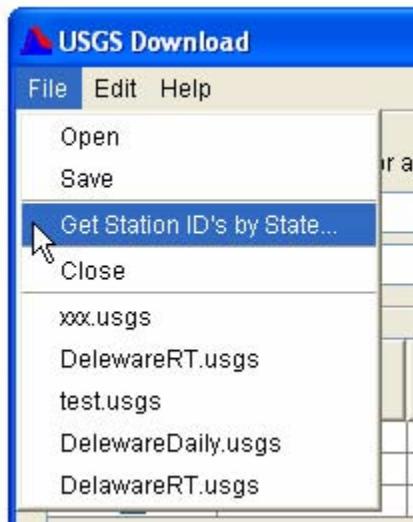
### Station ID Table

To open a previously saved table, select the **File** menu and then **Open**. Browse to the directory and file that you want to access and then press the **Open** button. Optionally, you can select a file from the most recently used file list at the bottom of the **File** menu. To save a table, select the **File** menu and then **Save**. Browse to the directory where you want to save your table and then enter the file name and press the **Save** button.

To manually enter station information, select the USGS Station ID cell on a blank row. Enter the USGS station ID number and then fill in the basin or river name, location name, parameter and version in the subsequent columns or accept the defaults provided after entering the station ID. If you need to add additional rows, select the **Edit** menu and then **Insert Rows**. Fill in the identifiers for any remaining stations that you want. Once you have completed your table, save it using **Save** from the **File** menu.

To automatically populate the station table with a list of stations by state from the USGS web site, select **Get Station ID's by State...** from the **File** menu, as shown in Figure 2. This will display a dialog box for you to select the state for data locations that you are interested in, as shown in Figure 3. Select the state and then select either the **Daily Gages** or **Real-time and Recent** radio button. The stations available are often different for historical and current data. The list will be downloaded when you press **OK**. The amount of time required for this will depend on the speed of your connection to the

internet and the number of station in the state that you selected. After the list has been downloaded, a message box will be displayed that indicates how many stations ID were retrieved.



**Figure 2** Automatically Populating Station Table



**Figure 3** State Selection

You can sort the station table by pressing on the column header of the column that you want to sort by. A second press of the column header will perform an inverse sort.

You may find the list of stations easier to use if you delete those stations that you are not interested in. To do this, highlight the rows in the table that you want to delete and then select **Delete** from the **Edit** menu. You can save your table by selecting **Save** from the **File** menu.

### Retrieving Data

To retrieve data from the USGS web site and import into HEC-DSS, select the radio button of the type you want (either Daily, Recent Daily, or Real Time) from the top panel

of the screen. If you want daily, you can enter a start date and end date for the time frame that you are interested in or leave those boxes empty to retrieve the period of record data. The date should be entered in the form of DDMMYY (e.g., 03FEB2005). Selecting the small box in the date field will provide a calendar tool to aid in setting the date. Even though you may specify dates, only data that is available within those dates from the web site can be retrieved. Generally, the latest data for historical daily values are at least a year old. You may want to check the USGS web site (at <http://waterdata.usgs.gov/nwis>) to verify what data is available for the stations that you are interested in. If you want recent daily or real time data, check the appropriate radio button and enter the number of days back that you want to retrieve data for. The maximum number of days back that the USGS offers data for is 730 for recent daily data and 31 days for real time data.

After the data type and time span have been set, select the stations from the table that you want data for by checking the box in the **Get Data** column for those stations. If you want to retrieve data for all stations in your table, press the **Select All** button. The data retrieval process will begin when you press the **Get Data** button. This operation will take some time, depending on your connection speed to the internet and how much data you have requested. A **Retrieve Progress** dialog box, as shown in Figure 4, will display the progress of the process. After data has been retrieved, the main catalog screen in HEC-DSSVue will be automatically updated.

Historical and recent daily data are stored with an E part of “1DAY”. The interval for real-time data will be set based on the frequency of the data retrieved. If the frequency varies, the data will be stored in an irregular interval format. You may want to use the interval modification functions available from the **Time Conversion** tab in the **Math Functions** screen to change the data to a desired interval.

### **Limitations**

The USGS plug-in currently has limited error detection capabilities. If you think that there are problems, you should check the HEC-DSSVue log screen for messages. The log screen is usually minimized in your task bar.

The USGS plug-in will indicate when data cannot be retrieved, but it may not give the reason why. You should check the USGS web page with a browser to ensure that what you are requesting is available. The web address is: <http://waterdata.usgs.gov/nwis>.